



Design and Modeling (DM) and Automation and Robotics (AR) Materials List

This document is intended to provide middle schools selected as part of **2013-2014 Iowa STEM Scale-Up Initiative** with a detailed list of materials necessary to properly implement the two foundation Gateway To Technology units, *Design and Modeling* and *Automation and Robotics*, for a classroom of up to 24 students. For class sizes larger than 24 additional materials will be needed. Also, for each section of up to 24 students the materials listed as "Consumable" will be needed. Many of the materials are items that schools may already have in a typical classroom (i.e. scissors, paper cutter, storage cabinet, tape measures). Therefore, each school should inventory their materials before placing any order (this includes additional materials needed for multiple sections).

All items listed below can be purchased Off-the-Shelf at numerous suppliers and the "Example Supplier" listed is merely a suggestion to provide further clarification prior to placing an order. It is likely that the "Estimated Unit Cost" will fluctuate over time. Prices may not include shipping, so please shop for the best deal and budget accordingly. For more information visit <http://www.pltw.org/program-support/2013-2014-purchasing-manual> or email productsupport@pltw.org.

This list excludes the following items:

- GTT Participation Fee of \$750 per year includes all GTT required software with unlimited seats. Each school is required to pay this annual participation fee.
- Teacher laptop(s), student computers, a printer, and a projector that meets or exceeds the minimum PLTW specifications.
- The Five VEX GTT Robotics Kits to be shipped directly to each selected school. NOTE: Additional kits must be purchased for class sections that exceed 25 students or to support multiple sections that run concurrently.
- The teacher training to be provided to each selected school for DM and AR (one teacher per session). NOTE: Schools must pay for any additional teacher training.

Item Name	Description	Material Requirement	Consumable	Example Supplier	Estimated Unit Cost	Unit of Measure	Quantity for 24 Students	Estimated Total Price
Deep Storage Organizer	Deep container to organize and store VEX parts. Adjustable/removable compartments are recommended.	2 per VEX Kit		Amazon.com	\$16.99	Each	10	\$169.90
Storage Organizer	Shallow container to organize and store small VEX parts and fasteners. Adjustable/removable compartments are recommended.	2 per VEX Kit		Amazon.com	\$15.85	Each	10	\$158.50
Storage Bin	Storage bin to store large VEX parts. Minimum of 18" bin is needed. NOTE: Example listed is a pack of 6, so only 1 is needed for up to 6 VEX kits.	1 per VEX Kit		Amazon.com	\$44.99	6 Pack	1	\$44.99
Storage Cabinet	Cabinet to organize and store containers of VEX parts and other items. 5 shelves and a locking handle are recommended. NOTE: Use existing storage cabinets if available.	1 per classroom		Home Depot	\$178.00	Each	1	\$178.00
Sandwich Bags	Any sandwich bag will work. Bags are for a VEX build activity and should be reused.	1 bag per 2 students		Wal-Mart	\$2.98	100 Pack	1	\$2.98
Digital Camera	Digital camera with decent resolution to document student work on class activities, projects, and problems. Video capability is highly recommended. NOTE: Most cell phones have picture and video capabilities, in which case this item is not needed.	1 per classroom		Amazon.com	\$79.95	Each	1	\$79.95
Memory Card	Memory card for digital camera. Minimum of 4GB is recommended. NOTE: Verify that item is compatible with digital camera prior to purchase. Product listed is a suggestion based upon suggested camera.	1 per camera		Amazon.com	\$7.49	Each	1	\$7.49
VEX Tool Kit	A group of tools that make working on your VEX Robot easier. Included wrenches fit VEX screws and shaft collars - (5) 5/64" Hex Driver, (5) 3/32" Hex Driver, (5) 3/32" Ball-End Hex Driver.	1 per classroom		VEX Robotics	\$39.99	Set	1	\$39.99
Hacksaw	Any hacksaw for cutting metal will work.	1 per 10 students		Home Depot	\$5.47	Set	3	\$16.41
Miter Box	Any miter box will work. To be used with hacksaw.	1 per 10 students		Home Depot	\$4.97	Set	3	\$14.91
Flat File	Flat file with handle. 8" bastard file recommended.	1 per 10 students		Harbor Freight	\$1.99	Each	3	\$5.97
Easy Cutter	Easy cutter with built in protractor to cut up to 1/4" wood pieces.	1 per 4 students		Amazon.com	\$16.57	Each	6	\$99.42

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Wire Stripper	Industrial wire stripper. 8 AWG stripping range recommended.	1 per 4 students		Amazon.com	\$12.81	Each	6	\$76.86
Needle Nose Pliers	Needle nose pliers. 4.5" recommended.	1 per 2 students		Amazon.com	\$2.49	Each	12	\$29.88
Combination Square	Minimum of 12" combination square with 1/16" graduations.	1 per 4 students		Home Depot	\$6.97	Each	6	\$41.82
Meter Stick - Dual Scale	If you cannot find a meter stick with both U.S. customary and metric scales, purchase separate meter and yard sticks.	1 per 4 students		Amazon.com	\$3.35	Each	6	\$20.10
Tape Measure - Dual Scale	Minimum of 12 feet. If you cannot find a tape measure with both U.S. customary and metric scales, purchase separate U.S. customary and metric tape measures.	1 per 4 students		Amazon.com	\$5.54	Each	6	\$33.24
Ruler - Dual Scale	12" minimum ruler with straight edges. Must have with both U.S. customary (1/16") and metric scales.	1 per student		Amazon.com	\$0.47	Each	24	\$11.28
Three Hole Punch	Any three hole punch will work.	1 per classroom		Amazon.com	\$1.99	Each	1	\$1.99
Paper Cutter	Paper cutter. Ability to cut multiple letter sized papers.	1 per classroom		Amazon.com	\$43.70	Each	1	\$43.70
Scissors	Any scissors will work. NOTE: Example listed is a classroom pack of 12, so only 1 is needed for up to 24 students.	1 per 2 students		Amazon.com	\$15.01	12 Pack	1	\$15.01
Utility Knife	Any craft/utility knife will work. NOTE: Remember to purchase blades if not included. Example listed comes with multiple blades.	1 per 2 students		Home Depot	\$1.98	Each	12	\$23.76
Hot Glue Gun	Any low temperature hot glue gun will work.	1 per 4 students		Amazon.com	\$6.44	Each	6	\$38.64
Butter Knife	Any butter knife will work. Plastic knives that are washed and reused are recommended.	1 knife per 2 students		Amazon.com	\$2.54	100 Pack	1	\$2.54
Melissa and Doug Construction Set in a Box	Construction Set in a Box (Item Number 490) by Melissa and Doug.	1 per classroom		Amazon.com	\$25.79	Each	1	\$25.79
Linking Cubes	Plastic 3/4" cubed in 10 colors connect on all six sides (Equivalent to Item Number 530118 from EAI Education).	8 cubes per 2 students		Amazon.com	\$12.07	100 Pack	1	\$12.07
Understanding Robots DVD	Understanding Robots (DVD) by Discovery Education.	1 per classroom		Discovery Education	\$59.95	Each	1	\$59.95
Engineers Can Do Anything! DVD	Engineers Can Do Anything! An Inspirational Guide into the World of Engineering Careers (DVD)	1 per classroom		Amazon.com	\$26.95	Each	1	\$26.95
Headphones	Any headphone with proper connector for classroom computer (typically 3.5mm) will work. NOTE: Example listed is a pack of 25, so only 1 is needed for up to 25 students. Encourage students to bring and use their own headphones, if possible. Follow appropriate sanitary measures if sharing headphones.	1 per student		Amazon.com	\$33.99	25 Pack	1	\$33.99
2" x 2" Board	Any 2" x 2" board will work. Approximately 3" will be needed for every 2 students in a class. NOTE: Teacher assembly is required prior to use by students (see lesson 2.3 Teacher Guidelines for instructions)	3" per 2 students		Home Depot	\$1.42	Each	1	\$1.42
1" Square Dowel	1" Square Dowel. Approximately 12" will be needed for every 2 students in a class. NOTE: Teacher assembly is required prior to use by students (see activity 1.4.4 for instructions)	12" per 2 students		Hobby Lobby	\$3.99	36" Dowel	4	\$15.96

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1" Dowel Rod	1" Dowel Rod. Approximately 3" will be needed for every 2 students in a class. NOTE: Teacher assembly is required prior to use by students (see activity 1.4.4 for instructions)	3" per 2 students		Hobby Lobby	\$2.99	36" Dowel	1	\$2.99
Safety Glasses	Impact resistant safety glasses with side shields and adjustable temples are recommended. NOTE: Some states allow safety glasses to be reused. Follow appropriate sanitary measures if sharing safety glasses.	1 per student	✓	Harbor Freight	\$1.89	Each	24	\$45.36
Engineering Notebook	PLTW Engineering Notebook ISBN Number 978-0-578-05027-0 NOTE: If you wish to make your own Engineering Notebook use the template found in Activity 1.1.1a.	1 per student	✓	PLTW	\$2.75	Each	24	\$66.00
Tagboard	Any tagboard or file folders will work. Minimum of 20 pound weight paper is recommended.	1 piece per student	✓	Amazon.com	\$8.88	100 Pack	1	\$8.88
String	Any string will work.	1 per classroom	✓	Amazon.com	\$5.22	Ball	1	\$5.22
Hot Glue Sticks	Make sure glue sticks work with hot glue gun.	1 per student	✓	Amazon.com	\$4.86	25 Pack	1	\$4.86
Glue Sticks	Any type of paper glue product will work. NOTE: Example listed is a pack of 18, so only 1 is needed for up to 36 students.	1 per 2 students	✓	Amazon.com	\$3.95	18 Pack	1	\$3.95
Paper Fasteners	Any paper fastener will work. 100 count box and 1/2" minimum is recommended.	1 fastener per student	✓	Amazon.com	\$4.99	100 Pack	1	\$4.99
Paper Clips	Any jumbo sized paper clip will work.	1 clip per student	✓	Amazon.com	\$1.06	100 Pack	1	\$1.06
Rubber Band	Any heavy duty, 1/8" x 7" rubber band will work. At least 1 per student is needed.	1 band per student	✓	Amazon.com	\$3.98	250 Pack	1	\$3.98
Invisible Tape	Any invisible tape and dispenser will work.	1 per 2 students	✓	Amazon.com	\$1.27	Each	12	\$15.24
Electrical Tape	Any electrical tape will work. 3/4" tape with a minimum of 30' per roll is recommended.	1 per classroom	✓	Amazon.com	\$0.95	Each	1	\$0.95
Masking Tape	Any masking tape will work. 1" tape with a minimum of 50' is recommended. NOTE: Example listed is a pack of 9, so only 1 is needed for up to 36 students.	1 per 4 students	✓	Amazon.com	\$15.10	9 Pack	1	\$15.10
Colored Pencils	Any colored pencil set of at least 4 colors will work. NOTE: Example listed is a classroom set of 240 (12 sets of 12 colors), so only 1 is needed.	1 set per 2 students	✓	Amazon.com	\$34.98	240 Pack	1	\$34.98
Permanent Markers	Any permanent marker set of at least 4 colors will work.	1 per 4 students	✓	Amazon.com	\$3.76	Set	6	\$22.56
TechCard Build-It Kit	TechCard Build-It-Kit (Item Number 283263) by Kelvin.	1 per classroom	✓	Kelvin	\$59.95	Kit	1	\$59.95
3/16" Dowel Rod	3/16" Dowel Rod. Approximately 6' will be needed for every student in a class.	3' per student	✓	Hobby Lobby	\$0.29	Each	24	\$6.96
Sandwich Ingredients	Teacher to choose and acquire sandwich ingredients needed for Activity 2.1.1a. Read suggestions in Teacher Notes regarding allergies. NOTE: Most school cafeterias will be able to provide the ingredients needed for this activity.	-	✓	School Cafeteria	-	-	-	\$0.00

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Food Service Gloves	One pair of food service gloves per student. One size fits all recommended. <small>NOTE: Most school cafeterias will be able to provide the ingredients needed for this activity.</small>	1 pair per student	✓	Amazon.com	\$0.88	100 Pack	1	\$0.88
Plates	Any plate will work. One plate per student. <small>NOTE: Most school cafeterias will be able to provide the plates needed for this activity.</small>	1 plate per 2 students	✓	Amazon.com	\$2.46	48 Pack	1	\$2.46

Estimated Total Price of Materials to outfit a Classroom for up to 24 Students \$1,336.45

Estimated Total Price of Materials for Each Section of 24 Students \$303.38